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0111/0222

Some Inequalities for Differentiable Functions of Many Variables

$$(7)\, I_2 = \left[\int\limits_{(D_m)} \cdots \int \left(\int\limits_{(D_m)} \cdots \int \frac{\left| \frac{\partial^k f(X_m)}{\partial x_{i_1} \cdots \partial x_{i_k}} - \frac{\partial^k f(Y_m)}{\partial x_{i_1} \cdots \partial x_{i_k}} \right|^q}{|X-Y|^{m+\beta q}} \, dY_m \right) dX_m \right]^{1/q} \le$$

$$\le C_9 (A h^{m/q - n/p - k - \beta} + M h^{-k - \beta}).$$

In (6) and (7), h is an arbitrary positive number $\le Z$; C_i are constants not depending on A, M, h, H, ν, μ.
For additional assumptions on D all results can be extended to functions

Card 6/7

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S/020/60/135/004/004/037
0111/C222

Some Inequalities for Differentiable Functions of Many Variables

having generalized derivatives in the sense of S.L.Sobolev.
The author mentions S.M.Nikol'skiy and L.N.Slobodetskiy. There are
4 Soviet references.

ASSOCIATION: Leningradskoye otdeleniye matematicheskogo instituta imeni
              V.A.Steklova Akademii nauk SSSR. (Leningrad Branch of the
              Mathematical Institute imeni V.A.Steklov of the Academy of
              Sciences USSR)

PRESENTED: June 17, 1960, by S.L.Sobolev, Academician

SUBMITTED: June 14, 1960

Card 7/7

16.2600   16.3500

24028
S/039/61/054/003/001/001
C111/C444

AUTHOR: Il'in, V. P.

TITLE: Some integral inequalities and their applications in the
             theory of differentiable functions of several variables.

PERIODICAL: Matematicheskiy sbornik, v. 54, no. 3, 1961, 331-380

TEXT: The paper gives a detailed description of the formerly announced
results of the author (Ref. 12: Nekotoryye integral'nyye neravenstva
dlya differentsirnyemykh funktsiy mnogikh peremennykh [Some integral
inequalities for differentiable functions of several variables] DAN
SSSR, t. 129, no. 6 (1959), 1214-1217; Ref. 13: Nekotoryye funktsional-
'nyye neravenstva tipa teorem vlozheniya svesom [Some functional in-
equalities of the type of embedding theorems with weight] DAN SSSR,
t. 129, no. 5 (1959), 983-985). The results overlap partially with
V. P. Glushko (Ref. 14: Ob operatorakh tipa potentsiala i nekotorykh
teoremakh vlozheniya [On operators of the potential type and some em-
bedding theorems] DAN SSSR, t. 126, no. 3, (1959), 467-470).
The author considers generalisations of well-known integral inequali-
ties of the Hilbert inequality type (especially one of a two-parameter
inequality of Hardy and Littlewood (Ref. 2: Some properties of fractio-
nal integrals. I, Math. Zeitschrift, 27, no. 4 (1928), 565-606)), on
Card 1/14

Some integral inequalities...

the higher dimensional case as well as their use in functions of seve-ral variables.

Let E_n be the Euclidean space of $X=X_n=(x_1,\ldots,x_n)$ and E_m the space of $Y=Y_m=(y_1,\ldots,y_m)$; $1 \leq m \leq n$. If the coordinates of X are divided into two groups, then it will be written $X_n=(X_k,X_{n-k})$, where $X_k=(x_1,\ldots,x_k)$, $X_{n-k}=(x_{k+1},\ldots,x_n)$.

Let $Z=Z_n=(z_1,\ldots,z_n)$ be a point of E_n. We define: $X_n-Z_n=(x_1-z_1,\ldots,x_n-z_n)$; $Y_m-Z_n=(Y_m-Z_m,Z_{n-m})=(y_1-z_1,\ldots,y_m-z_m,-z_{m+1},\ldots,-z_n)$;

$$r_1=|X_n-Z_n|=\sqrt{\sum_{i=1}^{n}(x_i-z_i)^2}, \quad r_2=|Y_m-Z_n|, \quad r=|X_n-Y_m|.$$

Let $D=D(X)$ be a measurable set in E_n, $f(X)=f(x_1,\ldots,x_n)$ a function, measurable in D such that $|f(X)|^p$, $p \geq 1$, is summable; then is

Card 2/14

24028
S/039/61/054/003/001/001
0111/0444

Some integral inequalities ...

$f \in L_p^{(n)}(D)$ and $\| f \|_{L_p^{(n)}(D)} = \left[\int \overset{(n\text{-times})}{\cdots (D) \cdots} \int | f |^p \, dX \right]^{1/p}$, $dX = dx_1 \ldots dx_n$.

$f \in L_\infty^{(n)}$ is defined as usual. If $D = E_n$, then $f \in L_p(E_n)$ or $f \in L_p^{(n)}$ is written instead of $f \in L_p^{(n)}(E_n)$. Let $D(X,Y)$ be a measurable set in $E_n \times E_m$. $D_y(X)$ be the section of $D(X,Y)$ at a fixed Y; $D(Y)$ being the projection of $D(X,Y)$ on E_m, and $D(X)$ the projection of $D(X,Y)$ on E_n. Let $\sigma(X,Y)$ be a non-negative measurable function in $D(X,Y)$ and $f(X)$ measurable in $D(X)$.

Let

$$\| f \sigma \|_{L_p^{(n),(m)}} = \sup_{Y \in D(Y)} \left[\int \overset{n}{\overbrace{\cdots \cdots}_{(D_y(X))}} \int | f \sigma |^p \, dX \right]^{1/p}$$

if the right hand is finite. In that case be

$f \sigma \in L_{p,\infty}^{(n),(m)}(D(X,Y))$ and if $D(X,Y) = E_n \times E_m$, then $f\sigma \in L_p^{(n),(m)}$.

Card 3/14

Some integral inequalities ...

For $p \geqslant 1$ let p' be defined by $\frac{1}{p} + \frac{1}{p'} = 1$; for $p = \infty$, $q = 1$ and q' be

defined by $\frac{1}{q} + \frac{1}{q'} = 1$, let $\frac{p}{q'} = 1$.

§ 1 Some integral inequalities of the Hilbert inequality type.
Five theorems, generalising the above mentioned inequality from $[2]$ in
different directions, are proved by aid of four lemmata e. g.
Theorem 1.1:
Let $\qquad p \geqslant 1$, $q \geqslant 1$, $\frac{1}{p} + \frac{1}{q} \geqslant 1$, $1 \leqslant m \leqslant n$, $\beta < \frac{m}{q}$, $f(X_n) \in L_p(E_n)$,

$g(Y_m) \in L_q(E_m)$, $Z_n = (z_1, \ldots, z_n)$, z_1 being fixed numbers. Further:

1.) $K_1 = K_1(X_n - Z_n, Y_m - Z_n) = \begin{cases} r_1^{-\alpha} \, r_2^{-\beta} \, r^{\alpha+\beta} \; -(\frac{n}{p'} + \frac{m}{q}) & \text{for } r_2 \leqslant r_1 \\ 0 & \text{for } r_2 > r_1 \end{cases}$

where $\alpha > -\beta$ and for $p > 1$, $\frac{1}{p} + \frac{1}{q} > 1$ holds $\alpha + \beta \geqslant 0$

(for $p = q = 1$: $\beta \leqslant 0$, $\alpha \geqslant -\beta$);

2.) $\qquad K_1' = K_1 \, r^{\frac{n}{p} + \frac{m}{q} - \lambda}$, where $\lambda < \frac{n}{p'} + \frac{m}{q'}$, $\alpha > -\beta$

Card 4/14

Some integral inequalities ...

(for q = 1 : $\beta < 0$); h > 0.
Then:

$$I_1 = \overbrace{\int \cdots\cdots\int}^{n+m}_{(E_n \times E_m)} K_1(X_n - Z_n,\, Y_m - Z_n) f(X_n) g(Y_m) dX_n dY_m \leq M_1 \| f \|_{L_p(n)} \cdot \| g \|_{L_q(m)}$$

$$I_1' = \overbrace{\int \cdots\cdots\int}^{n+m}_{(r < h)} K_1'(X_n - Z_n,\, Y_m - Z_n) f(X_n) g(Y_m) dX_n dY_m \leq$$

$$\leq M_1' \| f \|_{L_p(n)} \cdot \| g \|_{L_q(m)} \; h^{\frac{n}{p'} + \frac{m}{q'} - \lambda} \qquad\qquad (17),(17')$$

where M_1 and M_1' are constants, depending on m, n, p, q, $\propto$, β, λ,
and not depending on f, g, h.
Theorem 5.1:
1.) Let

$$p > 1, \; q > 1, \; \frac{1}{p} + \frac{1}{q} > 1, \; 1 < m < n, \; 0 \leq \propto_0 < \frac{n}{p},$$

Card 5/14

Some integral inequalities ...

$$0 < \beta < \frac{n}{q'}, \qquad \gamma \frac{p}{q'} < \frac{n-m}{p'},$$

$$g(Y_m) \in L_q(E_m), \quad f(X_n) |X_{n-m}|^\gamma \in L_p(E_n), \quad f(X_n) r^{-\alpha_0} \in L_{p,\infty}^{(n),(m)},$$

$$K_5 = |Y_m|^{-\beta} r^{\beta + \gamma \frac{p}{q'} - \alpha_0} (1 - \frac{p}{q'}) - (\frac{n}{p'} + \frac{m}{q'}).$$

Then:

$$I_5 = \int \overbrace{\cdots\cdots}^{n+m} \int_{(E_n\ E_m)} K_5 f(X_n) g(Y_m) dX_n dY_m \leq$$

$$\leq M_5 \| g \|_{L_q^{(m)}} \cdot \| f |X_{n-m}|^\gamma \|_{L_p^{(n)}}^{\frac{p}{q}} \cdot \| f r^{-\alpha_0} \|_{L_{p,\infty}^{(n),(m)}}^{1 - \frac{p}{q'}} \cdot \qquad (21)$$

Card 6/14

24028
S/039/61/054/003/001/001
C111/C444

Some integral inequalities ...

2.) Let $p \geq 1$, $q \geq 1$, $\frac{1}{p} + \frac{1}{q} \geq 1$, $1 \leq m < n$, $0 \leq \alpha_0 < \frac{n}{p}$,

$0 \leq \beta < \frac{m}{q}$, (for $q = 1$: $\beta = 0$), $\gamma \frac{n}{q}, < \frac{n-m}{p}$ (for $p = 1$: $\gamma \leq 0$)

f and g the same as in 1.),

$h > 0, \lambda < \frac{n}{p}, + \frac{m}{q}, \quad K_5' := K_5 \, r^{\frac{n}{p}, + \frac{m}{q}, - \lambda}$.

Then:

$$I_5' = \int \cdots \overbrace{\int}^{n+m}_{(r \leq h)} K_5' \, f(X_n) \, g(Y_m) \, dX_n \, dY_m \leq \qquad (21')$$

$$M_5 \, h^{\frac{n}{p}, + \frac{m}{q}, - \lambda} \| g \|_{L_q^{(m)}} \cdot \| f | X_{n-m} |^\gamma \|_{L_p^{(n)}}^{\frac{p}{q},} \cdot \| f r^{-\alpha} \|_{L_p^{(n), (m)}}^{1 - \frac{p}{q},}$$

Card 7/14

24028
S/039/61/054/003/001/001
C111/C444

Some integral inequalities ...

where M_5 and M_5' depend on f, g and do not depend on h.

§ 2. Some theorems on integrals of the potential type.

In this paragraph conclusions are brought in eight theorems from the theorems of § 1. e. g.

Theorem 6'. 2: If $p > 1$, $1 \leqslant m \leqslant n$ and besides

1) $$\gamma < \frac{n-m}{p'} ;$$

2) $$\frac{n}{p'} < \lambda + \gamma < \frac{n}{p'} + \frac{m}{p} ;$$

3) $$q' = \frac{m}{\lambda + \gamma - \frac{n}{p'}}$$

4) $$|X_{n-m}|^\gamma f(X_n) \in L_p (E_n).$$

then

Card 8/14

$$U(Y_m) = \int \cdots \overbrace{\cdots}^{n} \int_{(E_n)} \frac{f(X_n)}{(X_n - Y_m)^\lambda} dX_n \quad L_{q'} (E_m),$$

Some integral inequalities ...

while

$$\| u \|_{L_{q'}(E_m)} \leqslant M_6 \| f | X_{n-m} |^{\gamma} \|_{L_p(E_n)},$$ (29)

holds, where M_6 is independant from f.

§ 3. Auxiliary inequalities.

§ 4. Some inequalities for differentiable functions of several variables.

Let $f(X)$ be a continuous function which is defined in the domain D of the n-dimensional space, possessing continuous derivatives in the interior of D, D having the following property: To every point P of D one may be able to construct a sector of the n-dimensional sphere of constant radius and shape, the top of which lies at P, and which is entirely included in D. The class of such domains is called $C_{\mathfrak{X}}^n$,

$\mathfrak{X}$ being the maximal allowed radius of the sector.

Let

$$D^j f = \sqrt{\sum_{i_1,\ldots,i_j=1}^{n} \left| \frac{\partial^j f}{\partial x_{i_1} \ldots \partial x_{i_j}} \right|^2} .$$

Card 9/14

Some integral inequalities...

Eight theorems are proved e. g.

Theorem 5.4

Let $1 \leqslant m < n$, E_m — m - dimensional hyper-plane in E_n. Further be

$$p \leqslant 1, \gamma < \frac{n-m}{p'} \text{ (for } p = 1 : \gamma \leqslant 0), 1-\kappa \geqslant 1,$$

$$1 - k - \gamma > \frac{n-m}{p}$$

$$D \in C_\kappa^n, \ f(X) \in L_\gamma^{(n)} (D), \ D^\bullet f \cdot \varphi^\nu L_p^{(n)} (D),$$

where ϱ is the distance of $X \in D$ from E_m and q, δ are such that

1.) $1 \leq (\gamma, p) \leqslant q \leqslant \infty$, $\frac{m}{q} > \frac{n}{p} - (1-k) + \gamma$,

while for $p > 1$ and $1-k-\gamma < \frac{n}{p}$ it is $\frac{m}{q} > \frac{n}{p} - (1-k) + \gamma$.

2.) a) if $1 - k - \gamma \geqslant \frac{n}{p}$, then $0 \leqslant \beta < \frac{m}{q}$ (for $q = \infty : \beta = 0$)

Card 10/14

Some integral inequalities ...

b) if $1 - k - \gamma < \frac{n}{p}$, then $0 \leqslant \beta < \frac{m}{q} - \frac{n}{p} + 1 - k - \gamma$

and for $p > 1$ it is $0 \leqslant \beta \leqslant \frac{m}{q} - \frac{n}{p} + 1 - k - \gamma$.

D_m be the section of D through E_m , r_2 -- the distance of the variable point $Y \in D_m$ to an arbitrary fixed point of D.

Then holds the following inequality:

$$\left\| D^k f \cdot r_2^{-\beta} \right\|_{L_q(D_m)} \leqslant K_{10} \left\| f \right\|_{L^{(n)}(D)} h^{\frac{m-n}{q} - k - \gamma} +$$

$$+ K_{11} \left\| D^l f \cdot \rho^\gamma \right\|_{L_p^{(n)}(D)} h^{\frac{m}{q} - \frac{n}{p} + 1 - k - \gamma - \beta} , \qquad (45)$$

where h is an arbitrary positive number, not exceeding k, and k_{10},

Card 11/14

Some integral inequalities ...

k_{11} constants, not depending on f and h.

Theorem 6.4

Let $1 \leqslant p < \infty$, $0 \leqslant \alpha_0 < \frac{n}{p'}$, $-\frac{n}{p} < \alpha < \frac{n}{p'}$, $'1 - k \leqslant 1$.

Let $D \in C_{\varkappa}^n$, Z a fixed point of D, $f(X) \in L_{\psi}(D)$,

$\nu \geqslant 1$, $r_1^{\alpha} D^1 f \in L_p(D)$, $r^{-\alpha_0} D^1 f \in L_{p,\infty}^{(n),(m)}(D,D)$;

the numbers m, q, β satisfy the following conditions:

1) $1 \leqslant m \leqslant n,\quad m > -\alpha p$;

2) $\max(\nu, p) \leqslant q \leqslant \infty$;

3) $\frac{n}{p} - (1 - k) - \alpha_0 < \frac{m - \alpha_0 p}{q}$;

4)a) if $\frac{n}{p} - (1 - k) - \alpha_0(1 - \frac{p}{q}) + \alpha \frac{p}{q} \leqslant 0$, then

Card 12/14

Some integral inequalities ...

$$-\alpha\frac{p}{q} \leq \beta < \frac{m}{q} \quad (\text{for } q = \infty: \quad \beta = 0)$$

b) if $\frac{n}{p} - (1-k) - \alpha_0(1-\frac{p}{q}) + \alpha\frac{p}{q} > 0$, then

$$-\alpha\frac{p}{q} \leq \beta \leq \frac{m}{q} + 1 - k + \alpha_0(1-\frac{p}{q}) - \frac{n}{p} - \alpha\frac{p}{q}.$$

Let S_m be a bounded domain in the intersection D_m of D with an n-dimensional hyperplane. Then the following inequality holds:

$$\|D^k f \cdot r_2^{-\beta}\|_{L_q^{(m)}(S_m)} < K_{12}\|D^l f \cdot r_1^{\alpha}\|_{L_p^{(n)}(D)}^{\frac{p}{q}} \|D^l f \cdot r^{-\alpha_0}\|_{L_{p,}^{(n),(m)}(D,D_m)}^{1-\frac{p}{q}} h^{\ell} +$$

$$+ K_{13}\|f\|_{L_v^{(n)}(D)} h^{\frac{m}{q} - \frac{n}{v} - k} \cdot \begin{cases} h^{-\beta} & \text{for } \beta \quad 0, \\ d^{-\beta} & \text{for } \beta \quad 0, \end{cases} \quad (47)$$

Card 13/14

24028

S/039/61/054/003/001/001
C111/C444

Some integral inequalities ...

where $\mathcal{E} = \frac{m}{n} + \alpha_0 \left(1 - \frac{p}{q}\right) + 1 - k\frac{n}{p} - \frac{p}{q} - \beta$,

$d = \sup_{Y \in S_m} r_2$, $0 < n \leqslant \varkappa$, K_{12} and K_{13} not depending on f, h, d.

The author mentions: Kh. L. Smolitskiy.

There are 9 Soviet-bloc and 5 non-Soviet-bloc references. The three references to English-language publications read as follows: G. H. Hardy, J. E. Littlewood, G. Polia, Neravenstva [Inequalities], Moskva, SSL, (1948); G. H. Hardy, J. E. Littlewood, Some properties of fractional integrals. I. Math. Zeitschr., 27, no.4, (1928), 565-606; L. Nirenberg, Estimates and existence of solutions of elliptic equations, Comm. pure and appl. Math., 9, no.3, (1956), 509 - 530.

SUBMITTED: July 4, 1959

Card 14/14

16.4100

AUTHOR: Il'in, V. P.

TITLE: On the approximation of functions of the spaces $\widetilde{W}_p^{(1)}(D)$ and $W_p^{(1)}(D)$ by continuously differentiable functions

SOURCE: Akademiya nauk SSSR. Matematicheskiy institut. Trudy. v. 64. 1961, 61-78

TEXT: Sufficient conditions are given with respect to the region D of the n-dimensional Euclidean space E_n, under which the functions f, belonging to Sobolev's spaces $\widetilde{W}$ and W, can be approximated by continuously differentiable functions. The space $\widetilde{W}_p^{(1)}(D)$ is defined as the totality of functions $f(X)$ $(X = x_1, \ldots x_n))$ on D which have generalized derivatives (in the sense of S. L. Sobolev) of order $l = [l]$ ($[l]$ denoting the integral part of l), satisfying the conditions:

Card 1/5

On the approximation ...

S/517/61/064/000/002/006
D299/D301

$$\|f\|_{L_p(R)} = \left[\overbrace{\int \cdots \int}^{n} |f(X)|^p \, dX \right]^{\frac{1}{p}} < \infty. \qquad (1)$$

$$\|f\|_{L_p^{(l)}(R)} = \sum_{i_1, \ldots, i_l = 1}^{n} \left[\overbrace{\int \cdots \int}^{n} \left| \frac{\partial^l f(X)}{\partial x_{i_1} \cdots \partial x_{i_l}} \right|^p \, dX \right]^{\frac{1}{p}} < \infty, \qquad (2)$$

if l is an integer, and

Card 2/ 5

On the approximation ...

$$\|f\|_{L_p^{(l)}(D)} = \sum_{i_1,\ldots,i_l=1}^{\bullet} \left\{ \left[\int\cdots\int_{(D)}\right]\left[\int\cdots\int_{(D)}\right] \left| \frac{\partial^l f(X)}{\partial x_{i_1}\cdots\partial x_{i_l}} - \frac{\partial^l f(Y)}{\partial x_{i_1}\cdots\partial x_{i_l}}\right|^p \cdot \frac{dY}{|X-Y|^{n+(l-l)p}} \right] dX \right\}^{\frac{1}{p}} < \infty, \tag{2'}$$

if l is not an integer; (l is a non-negative number, $p \geqslant 1$). The space $\widetilde{W}$ is linear and normalized. A subclass of functions is singled out from the class of functions, belonging to W; namely those functions which have, in D, all possible generalized derivatives to l-th order inclusive, belonging to $L_p(D)$. This subclass is denoted by $W_p^{(l)}(D)$. The problem is considered of approximating the functions $f \in \widetilde{W}$ and $F \in W$, by a sequence of functions $\psi_\nu(X)$ ($\nu = 1, 2, \ldots$), belonging to $C^{(l)}(\bar{D})$, where $\bar{D} = D + \Gamma$ (Γ being the boundary of D).

Card 3/5

On the approximation ...

S/517/61/064/000/002/006
D299/D501

If $D = E_n$, such an approximation can be effected with any degree
of accuracy. If, however, D is not identical with the entire space
E_n, the approximation is not always possible. In the references it
was shown that for functions, belonging to $\widetilde{W}$, the approximation is
possible if D is a bounded region which is starlike with respect
to an interior point. In the present work, other sufficient condi-
tions for D are found, under which the approximation is possible.
In particular, the conditions are given, under which the spaces $\widetilde{W}$
and W coincide. Several lemmas are proved which lead to 3 fundamen-
tal theorems. The most important of these, is Theorem 2: Let 1 be
a non-negative number, $p \geqslant 1$, and D a region of E_n, satisfying the
conditions: a) D has the property $A(N, \varkappa)$ (which means that 2 fi-
nite systems of n-dimensional regions S_N exist, each of which co-
vers D); b) D belongs to $C(H, \sigma)$ if 1 is an integer, and to $C(H, \sigma,$
$K, \lambda)$, if 1 is not an integer; ($C(H, \sigma)$ means that D contains an n-
dimensional spherical sector with vertex X, radius H and solid

Card 4/5

On the approximation ...

S/517/61/064/000/002/006
D299/D301

angle σ, for every $X \in D$; $C(H, \sigma, K, \lambda)$ implies a similar condition with respect to 2 points X and Y). Then: 1) the spaces $\widetilde{W}_p^{(1)}(D)$ and $W_p^{(1)}(D)$ coincide; 2) for each function $f \in \widetilde{W}$, there exists a sequence of functions $\psi_\nu(X)$ which have continuous derivatives of any order in E_n, so that

$$\lim_{\nu \to \infty} \| f - \psi_\nu \|_{W_p^{(1)}(D)} = 0.$$

In conclusion, an example is given (taken from the references) which shows that the above approximation is not always possible (as condition $A(N, \mathcal{H})$ was not satisfied). There are 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc.

Card 5/5

89720

S/020/61/136/003/003/027
C 111/ C 333

16.3400

AUTHORS: Il'in, V. P., Solonnikov, V. A.

TITLE: Some Properties of Differentiable Functions of Many Variables

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 3,
pp. 538-541

TEXT: The authors consider functions which possess various differential
properties in several variables (see (Ref.1-4)).

Let $f(x_1, \ldots, x_n)$ be a smooth function; $h > 0$, $\alpha_i > 0$ $(i=1,2,\ldots,n)$
arbitrary constants; ν_i, l_i, s_i, k_i arbitrary nonnegative integers,
$0 \leq \nu_i \leq l_i$. It holds the identity:

$$D_{x_1}^{\nu_1} D_{x_2}^{\nu_2} \ldots D_{x_n}^{\nu_n} f(x) = \frac{c}{h^N} \int_0^{h^{\alpha_1}} \ldots \int_0^{h^{\alpha_n}} \left[f(x_1 + y_1, \ldots, x_n + y_n) \times \right.$$

$$\left. \times \prod_{i=1}^{n} \frac{\partial^{l_i}}{\partial y_i^{l_i}} \left[\frac{y_i^{l_i - \nu_i - 1}}{(l_i - \nu_i - 1)!} \psi_i(y_i, h^{\alpha_i}) \right] \right] dy_1 \ldots dy_n -$$

Card 1/ 10

89720
S/020/61/136/003/003/027
C 111/ C 333

Some Properties of Differentiable Functions of Many Variables

$$-C \sum_{i=1}^{n} x_i \int_{0}^{\sigma^{x_i}} \frac{dv}{\sigma^{x+v}} \int_{0}^{x_1} \dots \int_{0}^{x_n} \prod_{i=1}^{n} \frac{\partial_i^{J_i}}{\partial y_i} \left[\frac{y_j^{J-r-1}}{(l_j - r_j - l_j)} \Psi_j(y_j, \sigma^{x_i}) \right] dy_n \dots dy_n \, X$$

$$\times \int_{0}^{\sigma^{x_i}} \left[D_i^{J_i} f(x_1 + y_1, \dots, x_i + y_i + t/2, \dots, x_n + y_n) - \right.$$

$$\left. - 2D_i^{J_i} f(x_1 + y_1, \dots, x_n + y_n)][t_i v]_j^{J_i+r_i} (\sigma^{x_i} - y_i - t)^{J_i+v+i}] dt, \right.$$

$$+ D_i^{J_i} f(y_1 + y_1, \dots, x_i + y_i, \dots, x_n + y_n)][t_i v]_j^{J_i+r_i} (\sigma^{x_i} - y_i - t)^{J_i+v+i} +$$

$$+ t_i v]_j^{J_i+r_i+1} (\sigma^{x_i} - y_i - t)^{J_i+v+i}] dt,$$

$C, \gamma_{11}, \gamma_{21}$ are certain constants, $r = \sum_{i=1}^{n} x_i (\overline{l}_i + \nu_i + k_i + 3)$,

Card 2/ 10

Some Properties of Differentiable Functions of Many Variables

89720
S/020/61/136/003/003/027
C 111/ C 333

$$\Psi_j(y_j), \quad \sigma^{x_j} = (l_j - \nu_j) \int_{y_j}^{\sigma^{x_j}} (\sigma^{x_j} - t)^{J_j+r_j+2} t^{k_j} + \nu_j \, dt +$$

$$+ 2y_j \frac{\partial}{\partial \nu_j} \int_{y_j}^{\sigma^{x_j}} (\sigma^{x_j} - t)^{J_j+\nu_j+2} t^{k_j} + \nu_j \, dt +$$

$$+ \frac{1}{l_j - \nu_j - 1} y_j^2 \frac{\partial^2}{\partial \nu_j^2} \int_{y_j}^{\sigma^{x_j}} (\sigma^{x_j} - t)^{J_j+\nu_j+2} t^{k_j} + \nu_j \, dt.$$

Most of the results formulated below follow from the given identity.

Let D be a domain of the E_n with the property: in every point $y \in \overline{D}$ an n-dimensional rectangle can be constructed lying entirely in D, the corner of which is in x, and the edges of which are parallel to the axes of coordinates and have the constant length σ^n.
Moreover: If $(x_1, \dots, x_1, \dots, x_n)$ and $(x$

Card 3/ 10

89720

Some Properties of Differentiable Functions of Many Variables

$$f \in \mathcal{M}_{p_0 p_1 \cdots p_n}^{l_1 \cdots l_n}$$

can be continued, under remaining differential properties and norm, on the entire E_n (in the sense of the norm equivalence).

Let

$$\mathscr{X}_i \equiv \frac{1}{l_i}\left(1 - \sum_{j=1}^{n} \frac{1}{p_j l_j} + \frac{1}{p_i} \sum_{j=1}^{n} \frac{1}{l_j}\right) > 0.$$

Theorem 3: Let

$$f \in \mathcal{M}_{p_0 p_1 \cdots p_n}^{l_1 \cdots l_n} \quad (D).$$ Then it holds:

1.) If $\varepsilon_0 = 1 - \sum_{i=1}^{n} \frac{1}{p_i l_i} - \sum_{i=1}^{n} \mathscr{X}_i \mathcal{V}_i > 0$, then $f(x)$ is equivalent to a continuous function differentiable in $\overline{D}$ and

Card 6/10

Some Properties of Differentiable Functions of Many Variables

$$|D_{x_1}^{\nu_1} D_{x_2}^{\nu_2} \ldots D_{x_n}^{\nu_n} f| \leq c \, (\, \|f\|_{L_{p_0}(D)} \, h^{-\frac{1}{p_0} \sum_{i=1}^{n} \varkappa_i - \sum_{i=1}^{n} \varkappa_i \nu_i} \, +$$

$$+ \|f\|_{L_{p_1 \ldots p_n}^{l_1 \ldots l_n}(D)} \, h^{\varepsilon}_0 \,).$$

2.) If

$$\varepsilon_s = 1 - \sum_{j=1}^{n} \frac{1}{p_j l_j} - \sum_{j=1}^{n} \varkappa_j \nu_j + \frac{1}{q} \sum_{j=1}^{s} \varkappa_j > 0, \quad q \geq p_1 > 1$$

then

$$(1 = 0, 1, \ldots n)$$

$$|D_{x_1}^{\nu_1} D_{x_2}^{\nu_2} \ldots D_{x_n}^{\nu_n} f|_{L_q(D_s)} < C \, (|f|_{L_{p_0}(D)} h^{\frac{1}{q} \sum_{j=1}^{s} \varkappa_j - \frac{1}{p_0} \sum_{j=k}^{n} \varkappa_j - \sum_{j=1}^{n} \varkappa_j \nu_j}$$

$$+ |f|_{L_{p_1 \ldots p_n}^{l_1 \ldots l_n}(D)} h^{\varepsilon_s}).$$

Card 7/10

Some Properties of Differentiable Functions of Many Variables

3.) If $q > p_i > 1$ $(i = 0, 1, \ldots, n)$

$$1 - \sum_{j=1}^{n} \frac{1}{p_j^i j} - \sum_{j=1}^{n} \varkappa_j \, v_j + \frac{1}{q} \sum_{j=1}^{s} \varkappa_j = 0 \quad \text{then}$$

$$|D_{x_1}^{v_1} D_{x_2}^{v_2} \ldots D_{x_n}^{v_n} f|_{L_q(D_s)} \leq C \left(|f|_{L_p(D)} \, h^{\frac{1}{q} \cdot \frac{s}{j=1} \varkappa_j - \frac{1}{p_i} \sum_{j=1}^{n} \varkappa_j - \sum_{j=1}^{n} v_j} + |f|_{L_{p_i \ldots}} \right)$$

$h > 0$ is an arbitrary number which satisfies the condition.
$h \leq H \equiv \min_{i=1,\ldots,n} \varkappa_i^{1/\varkappa}$, D_s is the section of D by the hyperplane
$x_{s+1} = \text{const}, \ldots x_n = \text{const}$.

Card 8/10

89720

S/020/61/136/003/003/027
C 111/ C 333

Some Properties of Differentiable Functions of Many Variables

Theorem 4 is a further embedding theorem (an analogue of the theorem in (Ref.7) for the Sobolev spaces W_p^1).

Theorem 5 says that, if D is finite, the set $\{f\}$ is bounded in the norm of

$$\mathfrak{M}\, {}^{l_1 \ldots l_n}_{p_0 p_1 \ldots p_n}(D)$$ and the condition 1) or 2) of

theorem 3 is satisfied, then the set

$$\left\{D\,{}^{\nu_1}_{x_1} \ldots D\,{}^{\nu_n}_{x_n}\, f\right\}$$ is compact in C or $L_q(D_s)$.

A similar statement refers to theorem 4.

Theorem 6 is a special case of part 3 of theorem 3 and theorem 4, if $D = E_n$ and $h = \infty$.

Card 9/10

89720

S/020/61/136/003/003/027
O 111/ C 333

Some Properties of Differentiable Functions of Many Variables

Theorem 7 is a partially special inversion of theorem 6.

There are 7 references: 6 Soviet and 1 Italian.

ASSOCIATION: Leningradskoye otdeleniye Matematicheskogo instituta imeni V. A. Steklova Akademii nauk SSSR (Leningrad Branch of the Mathematical Institute imeni V. A. Steklov of the Academy of Sciences USSR)

PRESENTED: July 28, 1960, by V. J. Smirnov, Academician

SUBMITTED: July 21, 1960

Card 10/10

IL'IN V.P.

Approximation of functions from $W_p^{(1)}(D)$ and $W_p^{(1)}(D)$ spaces by continuously differentiable functions. Dokl.AN SSSR 137 no.6:1283-1286 Ap '61.   (MIRA 14:4)

1. Leningradskoye otdeleniye Matematicheskogo Instituta imeni V.A. Steklova AN SSSR. Predstavleno akademikom V.I.Smirnovym.
                    (Functional analysis)

IL'IN, V.P.; SOLONNIKOV, V.A.

Some properties of differentiable functions of several variables.
Trudy Mat.inst. 66:205-226 '62.   (MIRA 15:11)
                    (Functions of several variables)

IL'IN, V.P.

Properties of some classes of differentiable functions of several
variables defined in an n-dimensional region. Trudy Mat.inst. 66:
227-363 '62.   (MIRA 15:11)

(Functions of several variables)

IL'IN, V.P.

Inequalities between the norms of partial derivatives of functions of several variables. Dokl. AN SSSR 150 no.5:975-977 Je '63.
(MIRA 16:8)

1. Leningradskoye otdeleniye Matematicheskogo instituta im. V.A. Steklova AN SSSR. Predstavleno akademikom I.M.Vinogradovym.
(Inequalities (Mathematics)) (Functions of several variables)

IL'IN, V.P.

Some inequalities between the norms of partial derivatives of
functions of several variables. Dokl. AN SSSR 152 no.2:262-
265.S '63.   (MIRA 16:11)

1. Matematicheskiy institut im. V.A. Steklova AN SSSR.
Predstavleno akademikom I.M. Vinogradovym.

IL'IN, V.P.

Splitting of parabolic and elliptic difference equations.
Sib. mat. zhur. 6 no.6:1425-1428 N-D '65.

(MIRA 18:12)

L 28470-66   EWT(m)/EWA(d)/EWP(v)/T/EWP(t)/EWI/EWP(k)   IJP(c)   JD/HW

ACC NR: AP6010139   (N)   SOURCE CODE: UR/0125/66/000/003/0011/0014

AUTHOR: Il'in, V. P.; Razikov, M. I.

ORG: Ural Polytechnic Institute im. S. M. Kirov (Ural'skiy politekhnicheskiy institut)

TITLE: Effect of thermal cycle of welding on the properties and phase composition of 30Kh10G10 chromium-manganese steel

SOURCE: Avtomaticheskaya svarka, no. 3, 1966, 11-14

TOPIC TAGS: austenitic   steel, chromium steel, manganese steel, arc welding, thermal effect, cooling rate,   phase composition /
/ 30Kh10G10 austenitic steel

ABSTRACT: 30Kh10G10 austenitic metastable chromium-manganese steel is highly cavitation-resistant and finds application as a protective coating for low-carbon and low-alloy metal of the parts of hydraulic machinery and water turbines. When heated above 600°C, however, its structure becomes unstable, which affects its mechanical properties. Hence it was of interest to investigate the thermal effect of welding cycle on the phase composition and mechanical properties of the metal in the zone affected by the welding heat. Specimens of this steel were tested under conditions simulating the effect of the thermal cycle of single-pass arc welding; the maximum

Card 1/2   UDC: 621.791.01:669.140.56.046

ACC NR: AP6010139

temperature was 1350-1400°C and the cooling rate varied within the limits of from 600 to 0.15°C per sec in the 750-650°C range. In this case the time of stay of specimens of this steel (3-5 mm thick sheets) in the dangerous temperature range (800-600°C) is determined by their cooling rate. The lower the cooling rate is, the greater the effect of the thermal cycle on the mechanical properties and phase composition of the metal. Findings: at a cooling rate of less than 1°C/sec the impact strength of the specimens drops sharply, although their ultimate strength remains almost the same whether the cooling rate is 600°C/sec or 0.15°C/sec. At cooling rates of from 600 to 40°C/sec hardness changes insignificantly and amounts to ~450 kg/mm², but if the cooling rate is further reduced (to 1.2°C/sec), hardness begins to increase and reaches 290 kg/mm², but below 1.2°C/sec it decreased again, evidently owing to the congulation and precipitation of fine-disperse carbides. Radiographic examination showed that the decrease in the impact strength of 30Kh10G10 steel is due to both the decomposition of austenite with segregation of γ- and α-phases and the precipitation of carbides at grain boundaries with consequent embrittlement of grain boundaries. These structural transformations ($\gamma \rightarrow \epsilon \rightarrow \alpha$, with ultimate segregation of carbide phase) account for the deterioration in the plasticity and impact strength of the metal. Thus, the welding regime of 30Kh10G10 steel should be such as to assure a cooling rate of at least 1°C/sec; hence, during single-pass welding of 30Kh10G10 sheet steel (3-5 mm thick) the linear energy should not exceed 2000-2500 cal/cm, i.e. this steel should be welded at minimal current intensity and high speed. Orig. art. has: 4 figures, 3 tables.

SUB CODE: 11, 13/   SUBM DATE: 30Nov64/ ORIG REF: 004

Card 2/2

IL'IN, V.P.

Some properties of classes of differentiable functions defined in a certain region. Trudy Mat. inst. 84:73-143 '65.

Inequalities between the norms of partial derivatives of functions of several variables. Ibid.:144-173 (MIRA 18:9)

IL'IN V. S.

"The Structure and Functional-Mechanical Properties of the Wood
of Various Forms of Birch as Distinguished by Its Bark." Cand Agr
Sci, Leningrad Order of Lenin Forestry Engineering Acad imeni S. M.
Korov, Leningrad, 1954. (KL, No 7, Feb 55)

SO: Sum. No. 631, 26 Aug 55- Survey of Scientific and Technical
Dissertations Defended at USSR Higher Educational Institutions
(14)

IL'IN, V. S.

1942

USSR/Radio Receivers, Battery
Radio receivers - Measurements   Jan 1946

"Utilization of Receiving Apparatus of Radio Centers for Two-way Group Telephone Communication," V. S. Il'yin, Engineer at the Telegraph-Telephone Section of the Nordvin Administration of the People's Commissariat of Communications, 1 p

"Vestnik Svyazi - Elektro Svyaz" No 1 (70)

Use of STs-6-M apparatus showed a lack of volume over long distance communication. Amplifier changes would entail too much new apparatus and an uneconomical expenditure of fuel. I. S. Rudin developed a method by which the standard battery
1942

USSR/Radio Receivers, Battery (contd)   Jan 1946
Radio receivers - Measurements

receivers BI-234 and RPK-9 and others could be so utilized to carry out two-way amplification of the flow of low frequencies.

IL'IN, V.S.

Using the variation method for calculations of "sudden" inhomogenei-
ties in wave guides. Izv.vys.ucheb.zav.; radiofiz. 1 no.3:88-94 '58.
(MIRA 12:1)

1. Saratovskiy gosudarstvennyy universitet.
(Wave guides)

85988

9,1300 (also 1006)

AUTHOR: Il'in, V.S.

TITLE: Variation Method of Calculating the Symmetrical
           Quadripole Discontinuities in Rectangular Radio
           Waveguides 25

TEXT: The Schwinger variation method was employed by Il'in
(Ref. 1) to analyse the discontinuity encountered when joining
two rectangular waveguides of different heights. In the
following the method is extended to the case when the wave-
guides are coupled by means of a grid-like diaphragm having
a finite length. The system considered is shown in Fig. 1.
The grid-like discontinuity has a thickness L . It is
assumed that in the axis y (perpendicular to the plane of
the drawing), the system is uniform and is bounded by two
walls situated in the planes $y = 0$ and $y = d$. Con-
sequently, the problem should be solved for the E-plane of the
waveguide. Moreover, it is assumed that the losses in the media
filling the waveguides I and II, the channels of the discontinuity

Card 1/5

85988

Variation Method of Calculating the Symmetrical Quadripole
Discontinuities in Rectangular Radio Waveguides

and the walls are negligible. The spacings b (Fig. 1) are
chosen so that only the dominant waves of the type H_{om} are
propagating in the two waveguides. The electric field components
E_x in the regions 1, 2, 3, ..., I and II can therefore be
expressed by Eqs. (1), where the propagation constants are
defined by Eqs. (2). R and T in the above equations
represent the reflection and transmission coefficients with
respect to the terminal planes $z = 0$ and $z = L$. By
comparing the field components at $z = 0$, a set of formulae
represented by Eqs. (3) is obtained. A similar procedure for
$z = L$ leads to Eqs. (4). The magnetic field component H_y
can be determined from Eq. (5). The comparison of the magnetic
field components at $z = 0$ and $z = L$ leads to a system
of two integral equations which are expressed by Eqs. (6) and (7).

Card 2/5

85988

S/141/60/003/004/013/019
E192/E382

Variation Method of Calculating the Symmetrical Quadripole
Discontinuities in Rectangular Radio Waveguides

These can be transformed by addition and subtraction so that
two different integral equations are derived; these are
given by Eqs. (8). Further transformation of Eqs. (8) can be
effected by introducing the notation defined by Eqs. (9).
From Eqs. (3), (4) and (9), it is possible to derive Eq. (10).

By multiplying Eqs. (8) by $E^{-(+)}$ and then integrating them
over O to b and taking into account Eq. (10), the relation-
ship between R and T can be expressed by Eqs. (11). These
represent two quadratic functionals. The problem now consists
of finding stationary points of the functionals given by
Eqs. (11). In other words, it is necessary to solve a
variation problem. The functions $E^{-(+)}$ can be represented
in the form of the series given by Eqs. (12), where the
coefficients a can be defined from the conditions expressed

by Eqs. (13). The functions $E^{-(+)}$ can be approximately
expressed by Eq. (14). Consequently, the functionals can be

Card 3/5

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S/141/60/003/004/013/019
E192/E382

Variation Method of Calculating the Symmetrical Quadripole
Discontinuities in Rectangular Radio Waveguides

written in the form of Eqs. (15). It is now possible to
determine the equivalent circuit of the discontinuity. This
is represented by the /T-type network shown in Fig. 2. The
impedances of this network are expressed by:

$$Z = \frac{1 + R - T}{1 - R + T} \; ; \quad Z + 2Z_{\text{ш}} = \frac{1 + R + T}{1 - R - T} \tag{16} .$$

On the other hand, by comparing Eqs. (15) and (16) it is
found that the impedances can be determined from Eqs. (17).
Eqs. (11) and (15) are employed to analyse some special
cases. First, the case of $L = 0$ is investigated (Fig. 3a).
Other cases which can be analysed by employing the above method
are illustrated by the remaining sketches in Fig. 3. It is
finally pointed out that a similar method can be employed
to analyse the H-plane in waveguide systems.

Card 4/5

85988
S/141/60/003/004/013/019
E192/E382

Variation Method of Calculating the Symmetrical Quadripole
Discontinuities in Rectangular Radio Waveguides

This paper was presented at the Third All Union Conference MVO SSR
on Radioelectronics.

There are 3 figures and 7 Soviet references, 1 of which is
translated from English.

ASSOCIATION: Saratovskiy gosudarstvennyy universitet
             (Saratov State University)

SUBMITTED: March 19, 1960

Card 5/5

KALININ, V.I., prof., doktor fiziko-matem. nauk [deceased];
    AKINDINOV, V.V.; GERSHTEYN, G.M.; DASHENKOV, V.M.; YEVSEYEV,
    V.I.; IL'IN, V.S.; KOROSTELEV, G.N.; LUCHININ, V.D.; NAUMENKO,
    Yu.P.;RYAZANOVA, T.P.; SEDIN, V.A.; TOLSTIKOV, V.A.; SHTYROV,
    A.I.; AVILOV, B.I., red.; ZENIN, V.V., tekhn. red.

[Practical work in radio physics] Radiofizicheskii praktikum.
Izd.2., dop. i perer. Saratov, 1961. 277 p.   (MIRA 15:1)

1. Saratov. Universitet. 2. Kafedra radiofiziki Saratovskogo
universiteta im. N.G.Chernyshevskogo (for all except Avilov,
Zenin).

                              (Radio)

IL'IN, V.S.; PITOVA, G.V.

Sulfhydryl groups of yeast nexokinase: their role in catalysis and in hormone action on enzyme activity. Vop.med.khim. 10 no.2:214-216 Mr-Ap '64.   (MIRA 18:1)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny AMN SSSR, Leningrad.

is known. The method is set forth as applied to four-pole irregularities in the undisturbed waveguide

S/0109/65/010/001

AUTHOR: Darbenkov, V. M.; ILYIN, V. Ф.

axisymmetrical delay

... over-a-grid. systems, (c) a second- system- de... h
... Printipial selection- TW-tubes-in- B.W-- lies tre
... of the- method. The dispersion equation set up
... exp... with respect to the propagation
... respect to the grating. The numbers... calcula...
... a computer. Orig. art. has ... figures etc

ASSOCIATION: none

... ... LN... SUB CODE ...

... ORDER: ...

KULIKOV, E.L.; IL'IN, V.S.; IL'IN, V.K.

Design of irregular waveguides using the "equivalent resonator"
method. Izv. vys. ucheb. zav.; radiotekh. 8 nb.1:18-26 Ja-F '65.
(MIRA 18:5)

DASHENKOV, V.M.; IL'IN, V.G.

Variational method for calculating axisymmetrical delay systems.
Radiotekh. i elektron. 10 no.2:269-283 F '65.
(MIRA 18:3)

IL'IN, V.S.; STEPANOVA, N.G.

Activity of hexokinase, glucose-6-phosphate dehydrogenase and glucose-6-phosphatase of liver cell fractions in rabbit embryos and full-grown animals following introduction of glucocorticosteroids. Vop. med. khim. 10 no.6:576-584 N-D '64.

(MIRA 19:1)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny AMN SSSR, Leningrad.

DOKUSOVA, O.K.; IL'IN, V.S.

Changes in energy metabolism in the liver of chickens with biotin deficiency. Biokhimiia 29 no.5:854-862 Jl-Ag '64.
(MIRA 18:11)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny AMN SSSR, Leningrad.

IL'IN, V.S.; TITOVA, G.V.

Hormone-enzyme complex: insulin-hexokinase. Biokhimiia   (MIRA 19:1)
30 no.6:1251-1256 N-D '65.

1. Otdel biokhimii Instituta eksperimental'noy meditsiny
AMN SSSR, Leningrad. Submitted April 3, 1965.

L 2608-66   EWT(1)/EWA(h)

ACCESSION NR: AP5020134   UR/0109/65/010/008/1540/1542

621.317.M

AUTHOR: Dashenkov, V. M.; Il'in, V. S.

TITLE: Measuring the coupling resistance of delay systems by means of dielectric bars

SOURCE: Radiotekhnika i elektronika, v. 10, no. 8, 1965, 1540-1542

TOPIC TAGS: delay system

ABSTRACT: A measuring technique is suggested which permits easy determining of squared spatial harmonics of the longitudinal and transverse components of the standing-wave electric field $\bar{E}_z^2$ and $\bar{E}_\tau^2$ for substituting them into this formula $\xi = \alpha_z E_z^2 + \alpha_\tau(\theta) E_\tau^2$. The formula gives the relative detuning of a delay system caused by insertion of a thin isotropic dielectric bar; α_z and α_τ are the bar polarizabilities; θ is the angle between the transverse component E_τ and the x-axis. In order to determine the above spatial harmonics, it is recommended to measure the maximum and minimum detunings for perpendicular orientations of the probe with respect to E_τ. The formulas were verified experimentally on an interdigital delay system consisting of 52 studs into which a

Card 1/2

L 2608-66

ACCESSION NR: AP5020134

0.51 x 3.51-mm ebony strip was introduced. Orig. art. has: 2 figures, 12 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 18Nov64   ENCL: 00   SUB CODE: IC

NO REF SOV: 004   OTHER: 000

Card 2/2

L 27677-66   ENP(k)/ENT(1)/T   GG

ACC NR: AP600752   SOURCE CODE: UR/0141/66/009/001/0016/0032

AUTHOR: Il'in, V. S.; Kostyunina, O. P.

ORG: Saratov State University (Saratovskiy gosudarstvennyy universitet)

TITLE: Diffraction of electromagnetic waves by ultrasonic waves in anisotropic medium -- Part 1

SOURCE: IVUZ. Radiofizika, v. 9, no. 1, 1966, 16-32

TOPIC TAGS: electromagnetic wave diffraction, ultrasonic diffraction

ABSTRACT: Diffraction patterns have been calculated by solving a scalar problem for the Fraunhofer zone; space effects in the medium, interface-reflection effects, etc. have not been fully accounted for (P. Debye, Ber. Sach. Akad. Wiss., v. 84, 125, 1932; C. Raman, N. Nath, Proc. Ind. Inst. Sc., 3(A), 75, 1936). The present article uses the variational method for studying the transmission of electromagnetic waves through an anisotropic layer (a crystal) whose dielectric constant is modulated by ultrasonic waves. Formulas for the diffraction field in both near and remote zones are developed. It is proven that, for the near zone, the system can be described by a diffusion matrix S of a 2(N + 1)-terminal network; this permits using the matrix method of circuit theory for studying various cascade connections of such devices. The above formulas cover, as particular cases, the classical formulas of scalar diffraction in an isotropic layer. Orig. art. has: 1 figure and 90 formulas.

SUB CODE: 20, 09 / SUBM DATE: 19Jul65 / ORIG REF: 009 / OTH REF: 007

Card 1/1   UDC: 621.371.167

L 31916-66   EWT(1)/T   WR

ACC NR: AF6010726   SOURCE CODE: UR/0142/66/009/001/0081/0089

AUTHOR: Il'in, V. S.

ORG: none

TITLE: Reflection properties of compound metal-dielectric arrays

SOURCE: IVUZ. Radiotekhnika, v. 9,
         no. 1, 1966, 81-89

TOPIC TAGS: UHF ANTENNA, ANTENNA
ARRAY, DIELECTRIC PROPERTY, ELECTRO-
MAGNETIC WAVE REFLECTION

ABSTRACT: General approxi-
mate formulas are developed
for the reflection and transmis-
sion coefficients of a planar
wave normally falling on a
laminated dielectric slab rein-
forced with shaped metal parts
(see figure). The formulas are
in the integral form and are

Generalized metal-dielectric antenna array
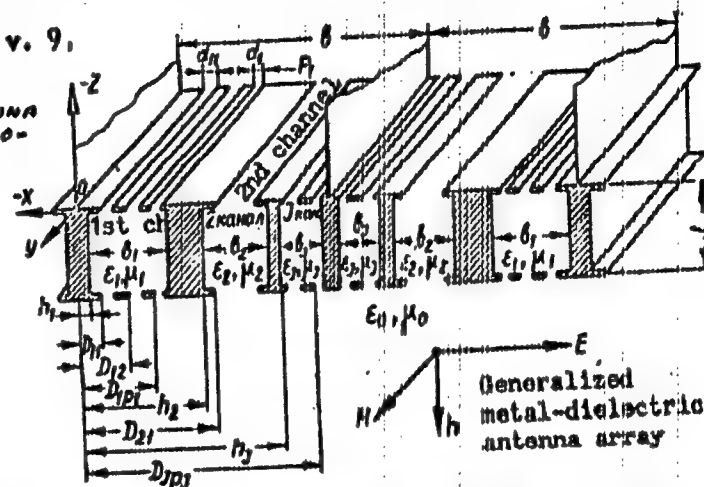
UDC: 621.396.673.4

Card 1/2

L 27660-66

ACC NR: AP6008284   SOURCE CODE: UR/0109/66/011/003/0471/0476

AUTHOR: Dashenkov, V. M.; Il'in, V. S.; Navrotskaya, Yu. M.

ORG: none

TITLE: Calculating natural frequencies of axially-symmetrical resonators and critical wavelengths of regular waveguides

SOURCE: Radiotekhnika i elektronika, v. 11, no. 3, 1966, 471-476

TOPIC TAGS: resonator, waveguide

ABSTRACT: The field structure in some periodic waveguides is such that description of the delay system, with $\varphi = 0$ and $\varphi = \pi$, can be reduced to consideration of the resonators whose configuration is determined by the geometry of one section of the delay system. Hence, the delay-system dispersion equation can be used for calculating the natural frequencies of such resonators. In an extreme case, when the radii of the delay system approximate infinity, the axially-symmetrical resonator "degenerates" into a shaped regular waveguide. Authors' formulas developed earlier (Rad. i elektronika, 1965, v. 10, no. 2, 269) for axially-symmetrical delay systems are adopted for single-ridge waveguides; this method is illustrated by a calculation of fundamental TE-mode in such a waveguide. Orig. art. has: 5 figures, 35 formulas, and 1 table.

SUB CODE: 09 / SUBM DATE: 16Nov64 / ORIG REF: 004 / OTH REF: 000
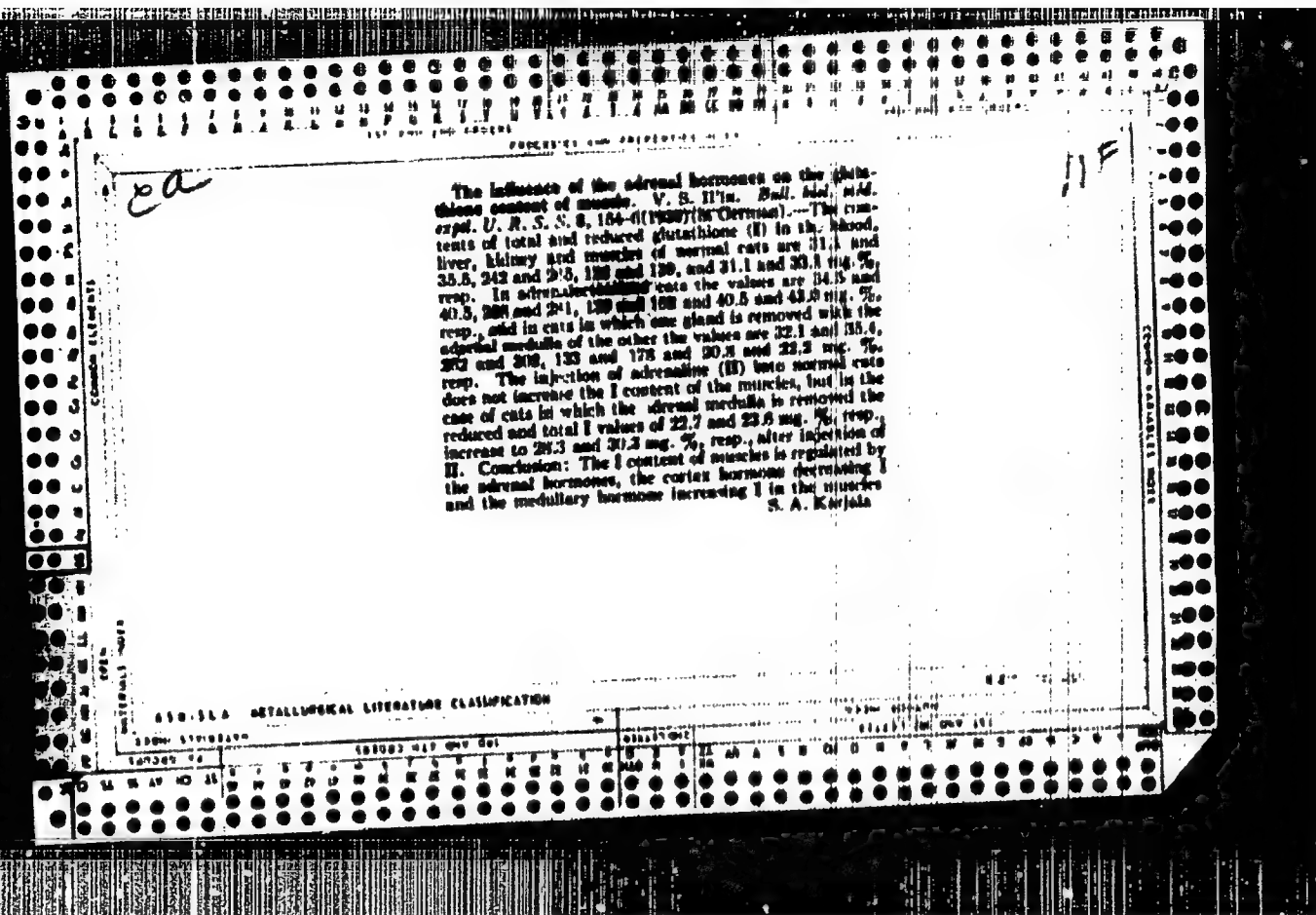   UDC: 621.372.834.001.24

Card 1/1

The glutathione content of the tissues and the blood after transfusion of large amounts of blood from another species. V. N. Il'in. *Bull. biol. méd. expl. U. R. S. S.* 6, 648-50(1938); *Chem. Zentr.* 1939, II, 2243-4. After the administration of large amts. of blood of a foreign species the glutathione content was increased in the kidneys, muscle and especially in the liver. This increase was chiefly at the expense of the sulfhydryl form. No essential change in the glutathione content of the heart muscle was observed. Extensive changes in the glutathione content of the blood took place, although no strict regularity in such changes in the blood could be established. According to I., the changes in glutathione content occurring in the tissues are due to disturbances of other processes of tissue metabolism and above all to those in protein metabolism. From this standpoint it is of interest to note that the greatest glutathione increase takes place directly in the liver, which is known to be the seat of the most intensive proteolytic processes in the organism.

M. G. Moore

The influence of the adrenal hormones on the glutathione content of muscle. V. S. Il'ia. *Bull. biol. méd. expl. U.R.S.S.* 8, 164-6(1939)(in German).—The contents of total and reduced glutathione (I) in the blood, liver, kidney and muscles of normal rats are 31.1 and 35.5, 242 and 2?8, 128 and 120, and 31.1 and 33.1 mg. %, resp. In adrenalectomized rats the values are 34.5 and 40.5, 261 and 2?1, 129 and 169 and 40.5 and 43.0 mg. %, resp., and in rats in which one gland is removed with the adrenal medulla of the other the values are 32.1 and 35.4, 2?2 and 3?8, 133 and 176 and 30.5 and 23.5 mg. %, resp. The injection of adrenaline (II) into normal rats does not increase the I content of the muscles, but in the case of rats in which the adrenal medulla is removed reduced and total I values of 22.7 and 23.6 mg. %, resp., increase to 28.3 and 30.2 mg. %, resp., after injection of II. Conclusion: The I content of muscles is regulated by the adrenal hormones, the cortex hormone decreasing I and the medullary hormone increasing I in the muscles. S. A. Karjala

METALLURGICAL LITERATURE CLASSIFICATION

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11 9

The oxidation coefficient of the urine and blood of dogs after injection of heterogeneous blood. V. A. N... Bull. biol. méd. exptl. U. R. S. S. 8, 473-4 (1940) (in English).—Injection of heterogeneous blood increased the ... of the blood. If the increase of sugar and lactic acid is taken into consideration, it becomes evident that the change of ... is insignificant and, consequently, the oxidation coeff. of the blood is practically unchanged. On injection of 3-5 cc./kg. of human blood into dogs no noticeable increase of the incompletely oxidized products in the blood was observed, and no increase of excretion of such products by the kidneys was obtained. Dogs without morphine endure the injection of heterogeneous blood better than those under morphine narcosis. Morphine narcosis seems to be one of the factors increasing the sensitivity of the dogs to heterogeneous blood. W. R. H.

ca.

PROPERTIES AND PROPERTIES INDEX

Effect of hormones of the adrenal cortex and medulla on
the glutathione content of blood. V. S. Il'in   J. Physiol.
U. S. S. R. 28, 642 (in English, 681-700); cf. C. A.
34, 2435. — The glutathione (I) content of liver, kidneys
and blood of rats is only slightly increased by adrenalec-
tomy, or by the removal of one and demedullation of the
other adrenal gland.   Adrenaline increases, and cortical
hormone decreases the amt. of I in muscles.   T. Laster

A.S.A.S.L.S   METALLURGICAL LITERATURE CLASSIFICATION

CO

116

Alloxan diabetes. V. S. Il'in. Klin. Med. (U.S.S.R.)
24, No. 10, 77-8(1946).—Review with many references.
G. M. Kosolapoff .

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

IL'IN, V. S.

USSR/Medicine - Fibrinogenase   Nov/Dec 46
                    Fibrin, Fibrinogen

"Fibrinogenase," V. S. Il'in, Leningrad, 9½ pp

"Uspekh Sovrem Biol" Vol XXVI, No 3 (6)

Tests with blood obtained from corpses and from
living organisms proved that fibrinogenase does
not convert fibrinogen to fibrin; Transition occurs
in another albumin (or other albumins) and there is
no coagulation under the influence of thrombin.
Name "Fibrinogenodestructase" is considered more
proper on strength of above tests.

3/50T94

The fibrinogenic and fibrinolytic factors (fibrinogenase) of blood of people who met sudden death. V. S. Il'in, *Biokhimiya* [4, 384-80(1940); cf. Wohlisch and Jühling, *C.A. 35, 8289*. — The blood of a person who died suddenly not only does not coagulate, but it possesses the property of liquefying coagulated blood of normal people and animals. The fibrinogenic and fibrinolytic factor of such blood is thermostabile, and is completely destroyed on heating at 55-58° for 40 min. An est. of fibrinogenase can be prepd. from the lungs of people who died suddenly. The active fibrinogenase leaves the lungs and enters the body during sudden death.   H. Primakof

ILIN, V. S.

U.S.S.R. / Human Animal Physiology. Metabolism.   T

Abs Jour: Ref Zhur-Biol., No 5, 1958, 21837.

Author : Ilin V. S.
Inst   : Institute of Experimental Medicine-Academy of
          Medical Sciences, U.S.S.R.
Title   : Regulation of Energy Metabolism and Its Mechanism.

Orig Pub: Yezhegodnik-Inst. Experim. Med. Nauk 1955,
          L 1956, 189-204.

Abstract: Resume: The significance of the process of oxid-
          izing phosphorylation and of different enzyme
          systems partaking in this process was considered
          in reference to energy metabolism of the cell.
          Data were furnished concerning changes of
          these factors by elevation of body temperature
          and starvation.

Card 1/1
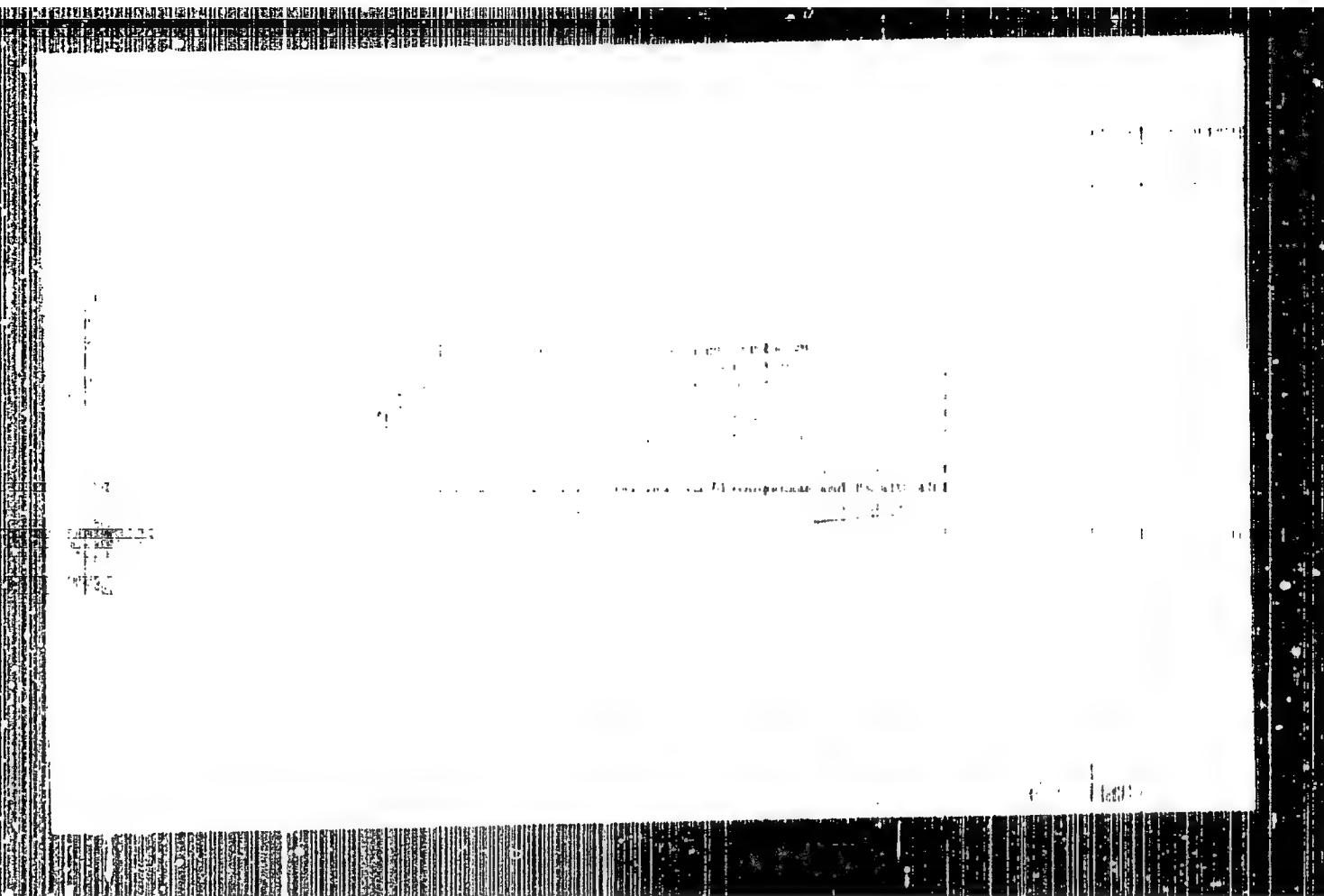
VESELKIN, N.V.; DAUDOVA, G.M.; IL'IN, V.S.

Method of etermining the ability of tissues to synthesize reducing phosphorus organic compounds. Met.po evol. fiziol. 1:76-78 '56.
(PHOSPHORUS ORGANIC COMPOUNDS)   (MIRA 11:1)
(TISSUE CULTURE)

USSR / Human and Animal Physiology (Normal and Patholo-   T
    gical). Blood. Blood Pressure. Hypertonia

Abs Jour: Ref Zhur-Biologiya, No 21, 1958, 97574

Author : Veselkin, N. V., Il'in, V. S.

Inst   : Not given

Title   : Synthesis of Ethero-Sulfuric Acids in an Organism
    After Denervation of the Liver

Orig Pub: V Sb.: Materialy po evolyuts. fiziologii, T. I.
    M.-L., AN SSSR, 1956, 85-90

Abstract: No abstract

Card 1/1

41

IL'IN, V.S.; TITOVA, G.V.

Mechanism of the action of insulin on the hexokinase reaction.
Vop.med.khim. 2 no.3:203-209 My-Je '56.   (MLRA 9:10)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny AMN SSSR,
Leningrad
    (INSULIN, effects,
        on hexokinase (Rus))
    (TRANSPHOSPHORYLASES,
        hexokinase, eff. of insulin (Rus))

IL'IN, V.S.; TITOVA, G.V.

Relation of hexokinase-inhibiting properties of β-lipoprotein fraction
of blood serum to cortisone and insulin. Vop.med.khim. 2 no.4: 243-251
Jl-Ag '56.   (MIRA 9:10)

1. Otdel biokhimii instituta eksperimental'noy meditsiny AMN SSSR,
Leningrad.
        (BLOOD PROTEINS,
            β-lipoprotein fractions, inhib. of hexokinase, eff. of
            cortisone & insulin (Rus))
        (TRANSPHOSPHORYLASES,
            hexokinase, inhib. by blood β-lipoprotein fractions,
            eff. of cortisone & insulin (Rus))
        (CORTISONE, effects,
            blood β-lipoprotein fractions inhib. of hexokinase (Rus))
        (INSULIN, effects,
            same)

V. S. ILIN

... and Animal Physiology. Blood.

Ref. Zhur-Biol., No 6, 1958, 26816.

Author : V. S. Il'in, T.I. Vol'face, Z.A. Chaplygina and K.V. Travkin

Inst :

Title : The Influence of the Nervous System on the Activity of Blood Fibrinogenase.

Orig Pub: Tr. Vses. obshestva fiziol., biokhim. i farmakologov, 1956, 3, 117-118.

Abstract: Active fibrinogenase was not detected in the blood of 30 healthy individuals, but was found in the day preceding a serious operation. In these same patients the active enzyme was found in only five cases a day after the operation. Analogous data was obtained

Card : 1/3

experi-
... brated cats.
... considerable in-
... system in the acti-
... the blood. In 13 out of

Card : 2/3

72

VESELKIN, N.V.; DAUDOVA, G.M.; IL'IN, V.S.

Acid-soluble phosphorus fractions in the mammary glands of rabbits
and the activity of glands in synthesizing reducing phosphorus
organic compounds. Mat.po evol. fiziol. 1:79-84 '57. (MIRA 11:1)
        (MAMMARY GLANDS)
        (PHOSPHORUS ORGANIC COMPOUNDS)

IL'IN, V.S.

Significance of hexokinase reaction and mechanisms regulating it. Ukr.biokhim.zhur. 30 no.6:911-943 '58. (MIRA 11:12)

(HEXOKINASE)

IL'IN, Vasiliy S., otv.red.; BIRYUKOV, D.A., red.; NEYFAKH, S.A., red.

[Phosphorylation and its functions; the 1958 symposium] Fosfori-
lirovanie i funktsiia; simpozium 1958 g. Leningrad, 1960. 377 p.
(MIRA 14:7)

1. Akademiya meditsinskikh nauk SSSR, Moscow. Institut eksperi-
mental'noy meditsiny.
          (Phosphorylation)

KHARAUZOV, N.A., prof., glavnyy red.; MIKHAYLOV, V.P., prof., zamestitel'
glavnogo red.; BIRYUKOV, D.A., prof., otv.red.; AVETIKYAN, B.G.,
doktor biol.nauk, red.; ANICHKOV, N.N., akademik, red.; ANICHKOV,
S.V., prof., red.; ARBUZOV, S.Ia., prof., red.; VESELKIN, P.N.,
prof., red.; VOYNO-YASENETSKIY, M.V., prof., red.; DANILOV, I.V.,
kand.biol.nauk, red.; ZHABOTINSKIY, Yu.M., prof., red.; ZHINKIN,
L.N., prof., red.; IL'IN, V.S., red.; IOFFE, V.I., prof., red.;
KARASIK, V.M., prof., red.; KUPALOV, P.S., prof., red.; MANINA, A.A.,
kand.med.nauk, red.; NEYFAKH, S.A., doktor biol.nauk, red.; RIKKL',
A.V., prof., red.; SVETLOV, P.G., prof., red.; SMORODINTSEV, A.A., prof.,
red.; CHISTOVICH, G.N., doktor med.nauk, red.; BESEDIN, I.K., tekhn.
red.

[Yearbook of the Institute of Experimental Medicine of the Academy
of Medical Sciences of the U.S.S.R. for 1958] Ezhegodnik za 1958 god.
Leningrad, 1959. 538 p.   (MIRA 14:1)

1. Akademiya meditsinskikh nauk SSSR, Moscow. Institut eksperimen-
tal'noy meditsiny. 2. Chleny-korrespondenty Akademii meditsinskikh
nauk SSSR (for Biryukov, Veselkin, Il'in, Ioffe, Karasik, Svetlov,
Smorodintsev). 3. Deystvitel'nyye chleny Akademii meditsinskikh
nauk SSSR (for Anichkov, S.V., Kupalov).
                    (MEDICINE, EXPERIMENTAL)

IL'IN, V.S.; HEYFAKH, S.A.

Conference on the problem of "Phosphorylation and function."
Vop.med.khim. 5 no.2:153-159 Mr-Ap '59. (MIRA 12:5)
(PHOSPHORUS METABOLISM)

ILIN, V. S. (Prof.)

"Regulation hormonale de l'activite glucokinasique du foie."

report submitted for the 1st Intl. Symposium on Coris Eater and Phosphorylated
Glucides, 16-18 Sept 1960, Milan, Italy

Director, Inst. Exptl. Medicine, Acad. Med. Sci. USSR

IL'IN, V.S., prof.

Nikolai Vasil'evich Veselkin; on his eightieth birthday. Pat.fiziol. eksp.terap. 4 no.1:91-92 Ja-F '60. (MIRA 13:5)

1. Chlen-korrespondent AMN SSSR.
(VESELKIN, NIKOLAI VASIL'EVICH, 1879-)

IL'IN, V.S.; SHANYGINA, K.I.

Hormonal regulation of the hexokinase reaction in the liver. Vop.
med. khim. 6 no.3:291-300 My-Je '60.   (MIRA 14:3)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny Akademii
meditsinskikh nauk SSSR, Leningrad.
            (LIVER)   (HEXOKINASE)   (DIABETES)
                    (CORTISONE)   (INSULIN)

IL'IN, V.S.; TRYUFANOV, V.F.

Incorporation of Methionine-S^{35} in liver proteins of rats with alloxan diabetes under conditions of a block or "circumvention" of the glucokinase reaction. Vop.med.khim. 6 no.4:386-389 Jl-Ag '60.   (MIRA 14:3)

1. Department of Biochemistry, Institute of Experimental Medicine, the U.S.S.R. Academy of Medical Sciences, and Chair of Biochemistry of the S.M.Kirov Institute for Postgraduate Medical Training, Leningrad.
            (DIABETES)   (METHIONINE)   (LIVER)
                      (PROTEIN METABOLISM)

ILIN, V. S., TRUFANOV, N. F., SHANGINA, K. I. (USSR)

   "The Inclusion of ^{35}S Methionine into Proteins of the Liver
   in Block and —Circumvention— of the Glucokinase Reaction."

Report presented at the 5th International Biochemistry Congress,
Moscow, 10-16 Aug 1961

IL'IN V

IL'IN, V.S.;   TRYUFANOV, V.F.

Inclusion of methionine-S^{35} into liver slices of rats with alloxan
diabetes in a medium containing glucose or fructose. Vop. med. khim.
7 no. 1:82-85 Ja-F '61.   (MIRA 14:4)

1. Chair of Biochemistry of the "S.M.Kirov" State Institute for
Advanced Medical Training and Department of Biochemistry of the
Institute of Experimental Medicine, Academy of Medical Sciences
of the USSR, Leningrad.
            (DIABETES)   (LIVER)   (METHIONINE)

IL'IN, V.S.; NLYFAKH, S.A.

Mechanisms of cellular and central rogulation of energy metabolism.
Vest. AMN SSSR 16 no.11:47-55 '61.   (MIRA 15:2)
          (CELL METABOLISM)   (NERVOUS SYSTEM)

IL'IN, V.S.; TITOVA, G.V.

Reproduction in vitro of the effect of insulin on the hexokinase activity of the liver. Dokl. AN SSSR 141 no.1:227-229 N '61.
(MIRA 14:11)

1. Institut eksperimental'noy meditsiny Akademii meditsinskikh nauk SSSR. Predstavleno akademikom V.N.Chernigovskim.
(HEXOKINASE)
(INSULIN)
(LIVER)

IL'IN, V.S.; KIL'EERA, L.A. [Kildkeraa, L.]

Effect of cortisone and insulin on the activity of hexokinase
in leucocytes. Vop. med. khim. 8 no.4:374-376 Jl-Ag '62.
(MIRA 17:11)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny AMN
SSSR, Leningrad i sektor biokhimii Instituta eksperimental'noy
i klinicheskoy meditsiny AN Estonskoy SSR, Tallin.

IL'IN, V.S.; TITOVA, G.V.

Effect of insulin in vitro on the activity of hepatic glucose-6-phosphate dehydrogenase and glucose-6-phosphatase. Biokhimiia 28 no.6:987-991 N-D'63   (MIRA 17:1)

1. Department of Biochemistry, Institute of Experimental medicine, Academy of Medical Sciences, Leningrad.

ZBARSKIY, Boris Il'ich [deceased]; IVANOV, Il'ya Il'ich;
MARDASHEV, Sergey Rufovich; IL'IN, V.S., red.

[Biological chemistry] Biologicheskaia khimiia. 4. izd.,
ispr. i dop. Leningrad, Meditsina, 1965. 519 p.
(MIRA 18:6)

GROMOVA, K.G.; IL'IN, V.S.

Identification of glucokinase in the adipose tissue of the epididymis of rat testicle and the stimulating effect of insulin on its synthesis. Biokhimiia 30 no.4:752-758 Jl-Ag '65.

(MIRA 18:8)

1. Otdel biokhimii Instituta eksperimental'noy meditsiny AMN SSSR, Leningrad.

IL'IN, V. S., CAND AGR SCI, "INTERVARIETAL HYBRIDS OF CORN IN OMSKAYA OBLAST." OMSK, 1961. (AUTHOR'S ABSTRACTS OF DISSERTATIONS PRESENTED AT OMSK AGR INST IM S. M. KIROV). (KL, 3-61, 225).

323

ILIN, V.S.

IL'IN, V.S.

Variational method of calculating symmetrical tetrapolar inhomogeneities in rectangular wave guides. Izv.vys.ucheb.zav.; radiofiz. 3 no.4:683-693 '60.   (MIRA 13:9)

1. Saratovskiy gosudarstvennyy universitet.
            (Wave guides)

KARMILOVA, L.V.; YENIKOLOPYAN, N.S.; NALBANDYAN, A.B.; IL'IN, V.T.
(Moskva)

Kinetics and mechanism of methane oxidation. Part 5:
Constant rate of methane oxidation. Zhur. fiz. khim.
35 no.7:1435-1442 Jl '61.   (MIRA 14:7)

1. Akademiya nauk SSSR, Institut khimicheskoy fiziki.
            (Methane) (Oxidation)

L 10716-66   EWT(d)/EWT(1)/EPF(n)-2/EWP(1)   IJP(c)   BB/WH/JX
ACC NR: AP5028515   SOURCE CODE: UR/0286/65/000/020/0098/0098

AUTHORS: Il'in, V. V.; Vasil'yev, G. I.; Novikov, I. B.; Tevelova, R. P.

ORG: none

TITLE: Analog-digital device for simulating problems of nonstationary heat
conduction. Class 42, No. 175750

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 20, 1965, 98

TOPIC TAGS: temperature simulation, analog digital converter, heat conduction

ABSTRACT: This Author Certificate presents an analog-digital device for
simulating nonstationary heat conduction. The device contains a network of
ohmic resistances and a device for setting the boundary conditions. To increase
the accuracy of simulation, the device contains a code-to-analog converter for
each node, which operate alternately in a storage and a voltage setting mode.
There is also one analog-to-code converter common to all the nodes, which is
connected sequentially through an electronic switch to the nodes of the network.

Card 1/2   UDC: 681.14.001.572

L 10716-66
ACC NR: AP5028515

Codes proportional to the voltages at these points are supplied to the inputs of
the code-to-analog converters operating in the storage mode.

SUB CODE: 09/   SUBM DATE: 18Jul64

Card 2/2

S/044/63/000/002/040/050
A0?0/A126

AUTHORS: Il'in, V.V., Borshchev, V.B., Rokhlin, P.Z.

TITLE: Can a machine think? (Survey of some viewpoints). (In order of
             discussion)

PERIODICAL: Referativnyy zhurnal, Mathematika, no. 2, 1963, 44, abstract 2l213
             (Tr. Kazansk. aviats. in-ta, 1961, 1961, no. 55, 69 + 80)

TEXT: In the authors' opinion, among a number of philosophical problems
of cybernetics under discussion one problem which was raised and given differing
solutions by many cyberneticians requires further discussion. "The problem
deals with the possibility or impossibility of carrying out an analogy between a
computer and the brain to the point of admission (or negation) that there arises
a property in a computer identical or close to consciousness or, more clearly,
to thought. Can a machine think? - This clear question produces two mutually
exclusive viewpoints: yes or no". The authors analyze the basic arguments in
support of the impossibility in principle of designing a thinking machine: the
algorithmic undeterminability of certain problems, the nonreducibility of think-

Card 1/2

Can a machine think? S/044/63/000/002/040/050
                                                    A050/A126

ing, as a special form of motion of matter, to the physical form of motion of
matter (to a lower form); the impossibility of simulating the subjective psy-
chological universe of man; in the authors' opinion none of these arguments can
be admitted as conclusive. "On the basis of the absence of contradiction to the
idea of the possibility of designing a thinking machine by any laws of science
or philosophy, this idea is admissible as a fully fledged scientific hypothesis.
Future experience will solve the question of the truth of this hypothesis". In
conclusion, the authors develop the thought that "in a whole number of works in
the last few years an attempt is present to comprehend the changes introduced in-
to the content of attributes of matter by the science of the twentieth century.
.. the so-called ontological nongeocentrism". Carrying out an analogy between
quantum theory, the theory of relativity, the authors consider that cybernetics
apparently is the science which gives us the first foundation for discovering
the elements of geocentrism in our consciousness and knowledge", since, "by de-
ciding in the affirmative the problem of the possibility of creating a thinking
machine we thus admit that there can exist not just a unique highly organized
material system (the brain) in which consciousness arose ... that other forms of
highly organized material systems in which consciousness arises are possible and
exist."

Card 2/2 [Abstracter's note: Complete translation]   A.M. Kondratov

FRIDMR, A.I.; ZAYTSEV, P.V.; IL'IN, V.V.; MITEKHIN, Ye.P.

Apparatus for thermal and cathodic atomisation and etching of metals in a gas discharge. Zav.lab.22 no.2:238-240 F '56.
(Metallography--Apparatus and supplies)   (MLRA 9:6)

SOV/48-23-2-1/20

21(7)
AUTHORS: Bashilov, A. A.,   Il'in, V. V.

TITLE: The Coefficients of the Internal Conversion of Some Nuclear
Transitions in As75 (Koeffitsiyenty vnutrenney konversii
nekotorykh yadernykh perekhodov v As75)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959,
Vol 23, Nr 2, pp 154-158 (USSR)

ABSTRACT: In a previous paper (Ref 4) the authors determined the co-
efficients of the internal conversion (CIC) of some nuclear
transitions in As75, that is to say, they determined the ab-
solute value

$$\alpha_K = g\tau \frac{n_e}{n_\gamma}$$

by measuring the number of conversion electrons n_e by means
of the magnetic spectrometer and by measuring the number of
photoelectrons n_γ struck out of a calibrated target by use
of one and the same radioactive source. τ, the photoelectric
absorption coefficient and g, the energy function are the
parameters of the apparatus, which were determined with

Card 1/3

SOV/48-23-2-1/20

The Coefficients of the Internal Conversion of Some Nuclear Transitions
in As75

specially calibrated samples and γ-rays with well known CIC.
The target was calibrated with γ-rays of ThB, Au^{198} and Cs^{137}
(Fig 1). The authors determined the CIC for nuclear transi-
tions in As75 with the energies E_γ = 265, 280, 305 and 401 kev,
which correspond to direct transitions from these energy levels
into the ground state of As75. Due to the fact that the intensi-
ty of E_γ = 305 and 401 kev is considerably weaker as compared
to E_γ = 265, 280 kev, two radiation sources of different thick-
ness with σ = 0.1 mg/cm² and σ = 0.5 mg/cm² were used. Fig-
ures 2, 3, 4 and table 1 contain the experimental data for
τ, g, n_e/n_γ and α_K. For comparative data of other authors see
table 2. There is a deviation by about 10%. The determination
of the transition types resulting from a comparison of the
theoretical and experimental values of α_K is given in table 3.
For the energies E_γ = 401, 305, 280, 265 kev spin and parity
of the individual levels were determined to be: $5/2^+$, $9/2^+$,
$5/2^-$, $3/2^-$ (ground state); corresponding transitions:

Card 2/3